



Making the change from weed to chemical cash crop (© Photodisc)

## Algae – a blooming success?

The chemical sector is one of the world's big industries alongside banking and IT. While most of the industry centres on petrochemicals, natural chemicals are increasingly in vogue.

The food, pharmaceutical and other sectors are all actively pursuing renewable and natural chemicals. Yet the agrisector is pressed by small production margins and strict rules governing environmental impacts.

A feasibility study, conducted by the consortium, looked at algae, and in particular the *Spirulina* genus, to see whether it could meet the demand for chemicals within the constraints of the agrisector. Algae are not typically associated in layman's terms with any beneficial effect – more often than not, during summer months, algal blooms plague coastlines or choke up ponds. But it's not all bad.

*Spirulina* algae are a natural source of such chemicals as phycocyanin, carotene, etc. Other potential products that could be extracted include pigments (for the food, textile and

polymer industries); essential fatty acids (for food applications); antioxidants and vitamins (for the cosmetics, pharmaceutical and food industries). Algae cultivation has the added bonus of being environmentally friendly when waste heat from power plants is used as well as its ability to fix carbon dioxide.

However, large-scale production of high quality algae derivatives is underdeveloped in the moderate climate zones of Europe. Climate limits the usefulness of standard cultivation methods.

### Green algae production

To counter this, the project has come up with an alternative solution based on new technologies. Cultivation is integrated into greenhouses supplied by waste heat from power plants and waste nutrients from the greenhouses themselves. New processes and procedures will be developed, allowing various high selling derivatives to be harvested from algae. Tests will focus on *Spirulina*.



FAIR-CT98-9664

*The chemical industry has in the past been heavily reliant on non-renewable materials. Obviously, interest is now gaining to find renewable sources. Algae are being targeted as a means of obtaining chemicals given the strong demand for fine chemicals and the pressures of modern sustainable agriculture in Europe. An algae cultivation technique that uses waste from other sectors is being developed by this project. At the same time they are looking at efficient means of extracting high selling additives from the algae. Algal cultivation as an industry is set to bloom thanks to the efforts of this European project.*



The quality of the derived product needs to be high. This will be evaluated and improved where necessary. The economic costs of using this system will be fully appraised so a true picture of its potential is obtained. To this end, the consortium consists of partners well versed in algal cultivation, chemical extraction and application development. End-user organisations will also be involved. Initially investment will need to be high. But this is expected to be recouped easily through

high profit margins: for each hectare of production, one million euro will be needed. This will yield 30 tons annually of *Spirulina*. It is estimated that, depending on the end-product, the net annual profit will be in the order of 0.2–0.3 million euro. With an estimated market volume of 220,000 tons per year in 2020, once the required quality can be met, the future really will be a blooming success for algal producers.



INFORMATION

FULL TITLE:

Production and processing of algae for industrial applications

CONTACT:

Adriaan Petrus  
 Algaetec BV  
 Van der Bogt  
 NL-2420 AB Nieuwkoop  
 Tel.: +31-34-8435435  
 Fax: +31-34-8435499

PARTNERS:

Biorès S.A. (BE)  
 General Extraction Products Flensburg GmbH (DE)  
 Acide Carbonatique Pur N.V.-S.A. (BE)  
 Plukmade Potcultues (NL)  
 CEBECO Handelsraad (NL)  
 Université de Liège (BE)  
 Dienst Landbouwkundig Onderzoek Instituut voor Agrotechnologisch Onderzoek (NL)  
 Ingenieursburo Innogas B.V. (NL)  
 Kimber Consulting (UK)

PROGRAMME:

FAIR, Cooperative Research Measures



LOCATION

- BELGIUM
- GERMANY
- THE NETHERLANDS
- UNITED KINGDOM

